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Anmeldung Nr./Application No./Demande n°/Patent Nr./Patent No./Brevet n°.

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Anmelder/Applicant/Demandeur/Patentinhaber/Proprietor/Titulaire

ALCATEL

COMMUNICATION

The European Patent Office herewith transmits as an enclosure the European search report for the above-mentioned European patent application.

If applicable, copies of the documents cited in the European search report are attached.

☐ Additional set(s) of copies of the documents cited in the European search report is (are) enclosed as well.

The following specifications given by the applicant have been approved by the Search Division:

☐ abstract

☐ title

☒ The abstract was modified by the Search Division and the definitive text is attached to this communication.

The following figure will be published together with the abstract: 3

REFUND OF THE SEARCH FEE

If applicable under Article 10 Rules relating to fees, a separate communication from the Receiving Section on the refund of the search fee will be sent later.





European Patent
Office

PARTIAL EUROPEAN SEARCH REPORT

Application Number

which under Rule 45 of the European Patent Convention shall be considered, for the purposes of subsequent proceedings, as the European search report

EP 03 29 0481

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	MOULY M; PAUTET M-B: "The GSM System for Mobile Communications" 1992, CELL & SYS., 4 RUE ELISEE RECLUS, F-91120 PALAISEAU, FRANCE XP002247807 Pages 231-248 * Section 4.3.1.1 * * Table 4.7 * * Section 4.3.2.8 *	1,2,4-10	H04L7/10 H04L25/49 H04J3/06
A	PATENT ABSTRACTS OF JAPAN vol. 015, no. 114 (E-1047), 19 March 1991 (1991-03-19) & JP 03 006142 A (KENWOOD CORP), 11 January 1991 (1991-01-11) * abstract *	3	
A	WO 99 26364 A (HIRT WALTER ;GFELLER FRITZ R (CH); IBM (US)) 27 May 1999 (1999-05-27) * abstract * * page 2, line 7 - page 3, line 29 * * page 4, line 6 - line 10 * * page 5, line 3 - line 21 * * figure 1A *	1-10	
			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			H04L H04J
INCOMPLETE SEARCH			
<p>The Search Division considers that the present application, or one or more of its claims, does/do not comply with the EPC to such an extent that a meaningful search into the state of the art cannot be carried out, or can only be carried out partially, for these claims.</p> <p>Claims searched completely : 1-10</p> <p>Claims searched incompletely : 11-12</p> <p>Claims not searched : 11-12</p> <p>Reason for the limitation of the search: Article 52 (2)(d) EPC - Presentation of information</p>			
Place of search MUNICH		Date of completion of the search 28 July 2003	Examiner Stolte, N
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 03 29 0481

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

28-07-2003

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
JP 03006142 A	11-01-1991	JP 1960987 C	10-08-1995
		JP 6091523 B	14-11-1994
WO 9926364 A	27-05-1999	WO 9926364 A1	27-05-1999
		DE 69719573 D1	10-04-2003
		EP 1034626 A1	13-09-2000
		JP 3373842 B2	04-02-2003
		JP 2001523913 T	27-11-2001
		TW 408529 B	11-10-2000



The examination is being carried out on the **following application documents**:

Text for the Contracting States:

AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IT LU MC NL PT SE SI SK TR LI

Description, pages:

1-17 as originally filed

Claims, No.:

1-12 as originally filed

Drawings, sheets:

1/6-6/6 as originally filed

The following documents (D) are referred to in this communication; the numbering will be adhered to in the rest of the procedure:

D1: MOULY M; PAUTET M-B: 'The GSM System for Mobile Communications' 1992, CELL & SYS., 4 RUE ELISEE RECLUS, F-91120 PALAISEAU, FRANCE XP002247807 (pages 231-248)

D2: PATENT ABSTRACTS OF JAPAN vol. 015, no. 114 (E-1047), 19 March 1991 (1991-03-19) & JP 03 006142 A (KENWOOD CORP), 11 January 1991 (1991-01-11)

D3: WO 99 26364 A (HIRT WALTER ;GFELLER FRITZ R (CH); IBM (US)) 27 May 1999 (1999-05-27)



1. Claims 11 and 12 are not allowable within the meaning of Article 52(2)(d) since a "packet format" is claimed as such. Since also a drawing of the claimed packet format with all its features (e.g. the synchronization part, the first and second data sequence) on a piece of paper falls within the scope of the claims, the applicant tries to seek protection also for the "presentation of information", which is excluded from patentability according to Article 52(2)(d). *OK.* ✓

Moreover, since a "packet format" is also an abstract interpretation of e.g. a signal form or a drawing, claims 11 and 12 are considered to relate to subject-matter which is essentially abstract in character, which is non-physical and therefore is not characterized by technical features in the sense of Rule 29(1) EPC. *OK*

2. Claims 11 and 12 do not meet the requirements of Article 84 EPC, since the category is not clear. According to the European Convention only two basic kinds of claims exist, viz, claims to a physical entity (apparatus) and claims to an activity (method) (c.f. Rule 29 EPC and Guidelines C-III-3.1). However, since a "packet format" refers to an abstract interpretation and not to a physical entity, and in claims 11 and 12 no method step is claimed, the category is rendered obscure. ✓
3. Due to the objections raised above in items 1 and 2, the examination with respect to Article 52(1) EPC is carried for claims 1-10, only.

II

1. The application does not meet the requirements of Article 84 EPC.
 - a. The claims are not concise. There are 4 independent claims in the category of apparatus, i.e. claims 7-10. In the present application, claims 7 and 9 both are directed to a transmitter, and claims 8 and 10 both are directed to a receiver. The various definitions of the invention given in these independent claims are such that the claims as a whole are not concise, contrary to Article 84 EPC, in particular since the subject matter represented in the different claims overlaps to such an extent that they could have easily been formulated as two independent claims (one for the transmitter and one for the receiver) and dependent claims as appropriate.

Under Article 84 in combination with Rule 29(2) EPC an application may contain more than one independent claim in a particular category only if the subject matter claimed falls within one or more of the exceptional situations set out in



Argument R 29

paragraphs (a), (b) or (c) of Rule 29(2) EPC.

The claims should be recast to include only two independent claims in the apparatus category, Rule 29(2) EPC, with dependent claims as appropriate, Rule 29(4) EPC.

- b. Due to the multiple independent claims in each category the set of claims as a whole further lacks clarity due to the complete lack of consistency between the independent claims in defining the essential features of the invention.
2. Independent method claim 1 is not acceptable in its present form because it does not meet the requirement following from Article 84 EPC taken in combination with Rules 29(1) and (3) EPC, that any independent claim must contain all the technical features essential to the invention (see also Guidelines C-III-4.3.(ii)).

In view of the description (see page 12, line 14 to page 13, line 10) it seems the feature that the first data sequence directly follows the synchronization sequence is indeed essential for carrying out the invention, because only for that order of synchronization and data sequences the disclosed synchronization method, as described on page 12, line 19 to page 13, line 6 works. For a different order, e.g. for a packet in which e.g. the synchronization sequence follows the first data sequence, the disclosed synchronization method does not work, since then during reception of the first data sequence the receiver is not synchronous and hence the data cannot be recovered.

It is emphasised however that this feature, although essential to clearly define the claimed subject-matter, does not in itself result in subject-matter involving an inventive step.

3. The objection with respect to lack of essential feature (Article 84 EPC together with Rules 29(1) and (3) EPC) as set out above in item 2 also applies to independent claims 7-11.
4. The method claim 1 does not meet the requirements of Article 84 EPC for the following reasons:
 - a. The wording on page 1, line 8 "using a first encoding" is grammatically wrong and hence unclear. It is not clear if "encoding" refers to an "encoding scheme" or an "encoding device". A better wording would be "using a first code" or "using a first encoding scheme".

The same objection equally applies to the wording on page 1, line 9.



- b. The wording on page 1, line 11 "detecting ... *in the first encoding*" is grammatically wrong and hence unclear. It is not clear if the expression "in the first encoding" refers to "in the first encoding device" or if it is claimed a method wherein "the synchronization part is searched and detected *within* the first code sequence". The same objection equally applies to the wording in line 13.

Moreover, since in lines 8-9 it is already defined how the synchronization part and payload part are encoded, the wording of the claim is not concise. It is therefore recommended to omit the respective passages.

- c. Also the wording "encoded in the first encoding" (page 1, line 17) is grammatically wrong and unclear, since it can be construed as "encoded in the first encoding device" or "encoded using the first encoding scheme". The same objection equally applies to the wording of line 18 "encoded in the second encoding" and also to page 1, lines 20-26 and page 2, lines 3-4.
- d. On page 1, in line 15 it is referred to "*the* transmission format" which however has no antecedent definition anywhere in the claim. Thus the subject-matter is not clear.
- e. The expression "*shortened* synchronization part" (page 1, lines 15-16) is a relative expression. However, the wording of the claim does not define whether "shortened" means "shorter than before" or "shorter than usual" or "shorter than the payload part". Hence the subject-matter of the claim is not clear (see Guidelines C-III-4.5).

Arg.

- f. Moreover, the wording of claim 1 is not supported by the description since on page 1, line 6 it is referred to "a synchronization part" and on page 1, lines 15-16 to "a shortened synchronization part". Consequently, according to the wording of the claim two synchronization parts are transmitted which is not supported by the description which only describes a packets with one synchronization part (see Fig. 3 and Fig. 5, lower chart).

Arg.

- g. The wording of the claim is contradictory, since on page 1, line 9 it is said that the payload part is encoded with the second encoding, whereas on page 1, lines 16-18 and also lines 20-21 it is said the first data sequence is encoded in the first encoding. Due to this contradiction the subject-matter of the claim is not clear.
- h. On page 1, lines 15-18 the applicant tries to define the claimed method by specifying the used transmission format, but without claiming any method step



how to generate such a transmission format. From the wording of the claim the reader is left in doubt if protection is sought for a method which merely comprises the expressly claimed method steps, or only for such a method which additionally generates the described transmission format. Consequently, the subject-matter of claim 1 is not clear.

- i. The wording on page 1, lines 15-19 does not clearly define into which parts the payload data is split. It is merely stated that "the payload part is split into a first data sequence", and that "the second data sequence" follows. However, it is not expressly defined that the payload is split into the first and the second data sequence.
- j. The present wording of the claim fails to define what comprises "the further interleaved steps" on page 1, lines 18-19, is it the "second data sequence", "the transmission format" or the "Method for transmitting packets". The wording should be clarified.
- k. Moreover, the wording "comprising further *interleaved steps* ..." is unclear and also is not supported by the description. The wording "interleaved" suggests that the steps, which are described in the sequel can be performed in arbitrary order, i.e. the first data sequence can be received at the receiver before being sent from the sender. This however is not understood as it does not make sense and also it is not supported by the description.

In addition, if sending of the first and second data sequence is performed in arbitrary order, the wording "*followed* by the second data sequence" (page 1, lines 17-18) is rendered obscure.

- 5. Concerning the other independent claims 7-11, the following objections with respect to Article 84 EPC are raised:
 - a. In claim 7 the wording "encoded in a first coding" (page 2, line 25-26) is grammatically wrong and hence unclear (see also objection in item 4c). This objection also applies to the wording on page 2, lines 26-27 "encoded in a second encoding", and also to claim 8 (page 3, lines 7-8 and page 3, lines 10-11), claim 9 (page 3, 19-21), claim 10 (page 3, line 29 and page 4, lines 3-4) and the wording of claim 11.
 - b. The wording in claim 7 "comprising a *synchronization unit* for generating the synchronization part" (page 2, line 24) is unclear since a synchronization unit usually denotes a unit at the receiver which performs synchronization (e.g. clock



synchronization). However, the subject-matter of claim is a "Sender", and hence the subject-matter of claim 7 is rendered obscure.

The same objection equally applies to the wording of claim 9, line 18.

- c. The wording in lines 25-26 of claim 7 and lines 19-20 of claim 9 "encoding unit for generating a first *data* sequence, encoded in a first encoding" is not clear since an encoding unit usually denotes a device which receives a data sequence from a data generating unit and which produces at its output an encoded sequence. The present wording of the claims fails to define that the "encoding unit" in fact is adapted to encode the data. The wording of the claims can be construed such that the "encoding unit" is merely a "data generating unit" and the encoding function is implemented in a different device.
- d. The wording of claims 7 and 9 also fail to define that the encoding unit also encodes the second data sequence.
- e. The wording in claim 8 "for *transmitting* packets" (page 3, line 2) is unclear since a "Receiver" is claimed, and not a sender. Hence, the subject-matter of the claim is rendered obscure.

The same applies to the wording of claim 10, in which only features of a receiver are described (see page 3, line 25 to page 4, lines 4), but an "Element for *transmitting* packets" is claimed.

- f. The wording on page 3, lines 6-9 of claim 8 is grammatically incorrect and it should be clarified. From the wording it is not clear if the "receiver unit" is a part of the claimed receiver or not.
- g. The category of claim 8 is not clear since in line 8 ("adapting") a method step is claimed.
- h. The present wording of claim 9 is not supported by the description. In line 16 and line 18-19 "an encoding unit" is claimed. Consequently, a Networking Element according to claim 9 comprises two "encoding units" (ie. a second encoding unit in the serialization unit), which is however not supported by the description.
- i. In claim 10 the wording from page 3, line 27 to page 4, line 1 is grammatically incorrect to such an extent that the subject-matter of the characterizing portion of the claim cannot not be determined. Moreover, the category of the claim is not clear, since method steps are claimed (page 4, line 1 "detecting", page 4,



line 2 "adapting").

III

1. Due to the present broad formulation of method claim 1 the disclosure of prior-art Document D1 can be read onto the subject-matter of claim 1.

Document D1 describes the GSM system in which the data is transmitted in bursts (packets) which comprise two information parts and one training sequence (see Table 4.3, page 232). The information is encoded prior to transmission (see section 4.3.2.2). In section 4.3.2.8 it is disclosed that information bits are encoded in two different ways, that is 182 bits are encoded and 78 bits are not encoded (see also Table 4.7, row TCF/FS Ia, Ib, II). The synchronization sequence is not encoded (it is transmitted as it is).

Hence, D1 discloses a method to transmit data, in which the synchronization part (i.e. the training sequence) is transmitted using a first encoding, the data sequence is split into a first and a second part (i.e. into 78 and 182 bits, see section 4.3.2.8), which are encoded using the first and a second encoding, and transmitting both parts of the data sequence. Furthermore, the receiver adapts the decoder by performing channel estimation with the training sequence (which is inserted into the burst specially for this purpose), and decodes the first and the second data sequence.

Consequently, the features of independent claim 1 are already known from Document D1 and thus the subject-matter of claim 1 is not novel. Claim 1 therefore is not allowable since it contravenes the requirements of Articles 52(1) and 54 EPC.

2. At most it could be alleged that the subject-matter of claim 1 differs from D1 in that the second data sequence does not follow the first data sequence, and the data is interleaved prior to transmission. However, the burst structure as disclosed in D1 (i.e. including interleaving of the data and insertion of the training sequence in the middle of the burst) is specially adapted to the mobile communication environment. In other circumstances a skilled person would consider a different burst structure with the training sequence being e.g. at the beginning of the burst and with a different ordering of the 78 and 182 encoded data bits (e.g. as shown in D3).

Hence, even if the applicant were to interpret the claim in such a manner as to enable him to allege that its subject-matter were novel, based on a trivial difference, the subject-matter would still not involve an inventive step in the light of documents



D1 (Article 56 EPC).

3. The same arguments as above apply to the subject-matter of claims 7 and 8 which correspond to that of claim 1 in terms of apparatus features for the sender and receiver. Therefore the subject-matter of claims 7 and 8 are not new in the sense of Article 54(1) and (2) EPC, or at least do not involve an inventive step (Article 56 EPC). As a consequence claims 7 and 8 are not allowable under Article 52(1) EPC.
4. The same arguments as given above with respect to claim 1 apply to the subject-matter of claims 9 and 10. Although these claims are directed "An Optical Network Element", the main features correspond to that of claim 1 in terms of apparatus features for the sender and receiver. The "reserve part" (claim 9, line 20) is also disclosed in D1 (section 4.3.1.1, 2nd paragraph: "include the guard time in the burst", see also Fig. 4.23). This "guard time" is added at the beginning and end of each burst. Transferring the disclosure of D1 to optical data transmission systems is not considered to involve an inventive step.

Therefore the subject-matter of claims 9 and 10 do not involve an inventive step (Article 56 EPC). As a consequence claims 9 and 10 are not allowable under Article 52(1) EPC.

5. Dependent claims 2, 4-6 do not appear to contain any additional features which, in combination with the features of any claim to which they refer, meet the requirements of the EPC with respect to novelty and/or inventive step, the reasons being as follows:
 - wo a. Claim 2: It is remarked that every sequence, in whichever way it is coded, theoretically enables synchronization.
 - yo b. Claim 4: Every GSM receiver estimates the channel properties from the received pattern and adapts the decoding steps accordingly. ✓
 - yfi c. Claim 5: Since in a mobile environment the channel conditions change, adaption is always time dependent. ✓
 - yfi d. Claim 6: A skilled person might always consider to include some CRC bits into the transmitted data in order to detect transmission errors at the receiver side (see e.g. D3, page 4, lines 6-10). ✓
6. The Applicant's attention is however drawn to the fact that the documents in the European Search Report do not seem to suggest a transmission of data packets in which the synchronization part and the first half of the payload data is transmitted



using a Manchester code and the second half of the payload data is transmitted using a non-return-to-zero code (see claim 3).

IV

The following formal deficiencies also have to be removed:

1. To meet the requirements of Rule 27(1)(b) EPC, the documents D1 and D2 should be identified in the description and the relevant background art disclosed therein should be briefly discussed.
2. The independent claim should be cast in the two-part "characterised" form required by Rule 29(1) EPC, having a preamble that correctly reflects the features disclosed in the closest prior art as represented by document D1.
3. The description must be brought into conformity with the new claims to be filed. In the introductory part, the statements indicating the technical problem to be solved should be revised with reference to the relevant prior art documents cited above (Rule 27(1)(c) EPC and Guidelines C-II-4.5).
4. On page 11 the number of Fig. 5 and 6 should be changed.
5. On page 12, line 8 should read "to **d**ecode the transmitted data".
6. On page 16, line 10 should read "is labelled **M**".
7. During revision of the application, due care should be taken not to add any subject-matter which extends beyond the content of the application as originally filed (Article 123(2) EPC).

In order to expedite the procedure, the Applicant is requested to clearly mark the amendments carried out, be it for amendments by addition, replacement or deletion and to indicate on which parts of the originally filed application documents these amendments are based (cf. Guidelines E-II-1).

In addition to the filing of a fair copy of the amended documents in triplicate an indication of the amendments could be done in hand written form on copies of the concerned parts of the originally filed application documents.



ABSTRACT / ZUSAMMENFASSUNG / ABREGE

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A method to generate a packet format is disclosed which enables to use shorter packets for data transmission. It is disclosed to transmit the data payload using two different line codes. The packet comprises a synchronization sequence (sync') (e.g. a dotting sequence or a Manchester encoded sequence), the first part of the data symbols (dat1) encoded with a Manchester code, and the second part of the data symbols (dat2) encoded with a non return-to-zero (NRZ) code. Between the first and the second data part a guard interval (rob') is inserted. At the receiver side, the clock synchronization unit can remain in the fast tracking mode until the end of the first data sequence (dat1) and hence the length of the synchronization sequence can be reduced. The invention is applied in the field of optical data transmission.

Extended European Search Report

This application is covered by the extended European search report pilot project at present running within the European Patent Office, applied to all European patent applications filed as first filing and searched on or after 01.07.03. Under this project the EPO issues together with the search report an opinion on whether the application and the invention to which it relates meet the requirements of the EPC. This non-binding opinion is issued free of charge as a service. This opinion may be used as the basis for an informed decision as to whether it is desired to pursue the application further or not.

For further details of this pilot project, the applicant's attention is directed to the Official Journal edition 5/2003. If any further immediate questions or comments arise the EPO Customer Services: +31-70-340 4500 or +49-89-2399 2828 can be contacted.

The examination has revealed that the application or the invention to which it relates appear **not** to meet the requirements of the Convention (see comments on enclosed Form 2906).

If the applicant wishes to continue with this application the examination fee must be paid. Where appropriate amendments can be filed to address the objections raised in the opinion, thus shortening the overall procedure. If no amendments are filed, the opinion will be re-issued as the first official communication under Article 96(2) and Rule 51(2) EPC.

If the examination fee has already been paid and the right to the communication under Article 96(1) EPC has been waived for this application, the first official communication under Article 96(2) and Rule 51(2) EPC will be issued promptly.